

SEQUENCE LISTING

<110> JOANNE CHORY AND ZHIYONG WANG

<120> GENES INVOLVED IN BRASSINOSTEROID
HORMONE ACTION IN PLANTS

<130> SALKINS.046A

<160> 14

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 2687

<212> DNA

<213> NUCLEIC ACID

<400> 1

```
actttagttt tgcctaattc atcgaaccct ctgattcatt ccaaagtgtt cccaactcgc 60
gttgatgggt cgggttcctc tgcttttaag acattagtta catgctcctg cactttctac 120
aaaataaacg tcataatcca aaaatattac atgatcatac atcatatatg ccgccgaacc 180
ttgttatggg acaaactcgt aaaccctttt ttctttttat gttcaatgaa ctatacaagt 240
tttggttatg aatacataaa taatgatgga cccagcaatt aatccaaaat ttggatatta 300
gatactaaag cttaaaatca acatgtaacc aaactaaata ctttatagaa catagtaaat 360
ggtattcacc aatctttata tcatttgtaa ggtacgaaga aggtaaaaaa aagagagagc 420
cagtgtacat acaactaatc aggacaaaag tagtcaaat tgtttctaaa gtgagatttg 480
tatgcaagaa aaaagtgata atttttaatt gaatatatca ttatgatgtt aatcacacgg 540
cttcactgta taaaataaaa ttttaaaaac caatcaaagt gtgtgttttt cggtcacaca 600
agtaagggac ccacactgaa gaaacggtcc cactgtgtct cctcctttct tttctctgta 660
ttatttggtc attactcatt ttacatactc acagaaaaaa aaaaagatta gaacataaac 720
acacgttact aagcgtagtt atcctctgca ccttaacata cacctcttat attcacctca 780
cgtaatctca cccttccaaa accatgtatt tacacgtgga cgatcgatac acaagaacaa 840
tgattcttaa tatgaactca atgtacttga acacacacac gaccaaatth ttacattaga 900
tgaaaaaaat attattatth gttggagaag aaagagagat tcttcttctt cgattccagc 960
gaaggaaaag cgtattcctc gtgagcacta acttctcact cctctcttct tcttcttcat 1020
cagtctacgt tcacacaatc tttcaccac ctattcaaag ctctctccgg aagtttcgag 1080
gggttggttg ttggttttcc cgatgacttc ggatggagct acgtcgacat cagcagctgc 1140
agctgcggcg gcggcagcag cggcgaggag gaagccgtcg tggagagaaa gggagaataa 1200
tcggaggaga gaaagacgga gaagagctgt agctgcgaag atatacactg ggcttagagc 1260
tcaagtgatg tataatttgc ctaaacattg tgataataat gaagtcctta aagctctttg 1320
tgttgaagct ggttggttg ttgaagaaga tggactact tatcgcaagg tgaagacttt 1380
ctccatthtt tccagatctg agcttgthtt attgatgttt ttgatgtttg aatctgaatt 1440
cgttgatttc aatttggttg aaatgggttt gaatctgaga atttgagggt tttctcaaag 1500
tgaatttgaa tcatcagaaa ctatggatgg atctgatttc tcaaagtga tttatgggtt 1560
ttctttctaa ttttagagtt attattggta tgctaaagtc ttaatctttt atgtatgata 1620
cttggtccaa agtcattgca ttgtgtttct tttgcttacc tgtgattgat tgatgtttga 1680
ttggttattg ttttgctttt gttggagtat cagggatgca agcctttacc tggtgagata 1740
gctgggactt catctcgagt aactccatat tcatcacaga accagagccc tctttcatca 1800
gcctttcaaa gtcccatccc atcttaccaa gttagccgt cttcttcatc attcccagat 1860
ccttctcgcg gtgaacaaa taacaacatg tctctacat tcttcccttt cctcagaaat 1920
ggtggcattc cttcttctct tcttccctc agaatctcaa acagttgtcc agttacccca 1980
ccggtctcat cgccgacttc taagaaccgg aaaccgttgc ctaactggga atctatcgct 2040
aagcaatcca tggccattgc taaacaatca atggcgtctt ttaattatcc tttctatgcy 2100
```

gtttctgcac	ctgctagtc	gacacatcgc	caccagtttc	ataccccggc	tactatacct	2160
gaatgtgatg	agtctgactc	ttccactgtt	gattctgggc	attggataag	ctttcagaag	2220
tttgcacaac	aacagccatt	ctctgcctct	atgggtgccaa	cctctcctac	cttcaatctt	2280
gtgaaacctg	cgcctcagca	gatgtctcca	aatactgctg	ccttccaaga	gattgggtcaa	2340
agctctgagt	ttaaatttga	gaatagccaa	gttaaaccct	gggaaggaga	gaggatacat	2400
gatgtgggta	tggaggatct	tgagcttaca	cttggaaatg	ggaaggctcg	tgggttgacat	2460
aaacaactag	gcaaacccaa	atggcatgtc	attggaatat	gagaaactaa	tcctcttgag	2520
tattttcttc	ttcgtccagg	tatttggatc	tttatggaat	ctcatatgtt	cttcacttat	2580
tatccaaata	tgctgcccaa	agccttctcc	atggaagcat	tggagtgtta	gagtgggttat	2640
tcaattcatg	aatttgggtt	caaaagcatt	atttgtagat	aaaaaaa		2687

<210> 2

<211> 2687

<212> DNA

<213> NUCLEIC ACID

<400> 2

actttagttt	tgccctaattc	atcgaaccct	ctgattcatt	ccaaatgttt	cccaactcgc	60
gttgatgggt	cgggttcctc	tgcttttaag	acattagtta	catgctcctg	cactttctac	120
aaaataaacg	tcataatcca	aaaatattac	atgatcatac	atcatatatg	ccgccgaacc	180
ttgttatggg	acaaactcgt	aaaccctttt	ttccttttat	gttcaatgaa	ctatacaagt	240
tttggttatg	aatacataaa	taatgatgga	cccagcaatt	aatccaaaat	ttggatatta	300
gataactaaag	cttaaaatca	acatgtaacc	aaactaaata	ctttatagaa	catagtaaat	360
ggtattcacc	aatctttata	tcatttgtaa	ggtacgaaga	aggtaaaaaa	aagagagagc	420
cagtgtacat	acaactaatc	aggacaaaag	tagtcaaaat	tgtttctaaa	gtgagatttg	480
tatgcaagaa	aaaagtgata	atttttaatt	gaatatatca	ttatgatgtt	aatcacacgg	540
cttcactgta	taaaataaaa	ttttaaaaac	caatcaaattg	gtgtgttttt	cggtcacaca	600
agtaagggac	ccacactgaa	gaaacggtcc	cactgtgtct	cctcctttct	tttctctgta	660
ttatttgggtc	attactcatt	ttacatactc	acagaaaaaa	aaaaagatta	gaacataaac	720
acacgttact	aagcgtagtt	atcctctgca	ccttaacata	cacctcttat	attcacctca	780
cgtaatctca	cccttccaaa	accatgtatt	tacacgtgga	cgatcgatac	acaagaacaa	840
tgattcttaa	tatgaactca	atgtacttga	acacacacac	gacccaattt	ttacattaga	900
tgaaaaaaat	attattatth	gttggagaag	aaagagagat	tcttcttctt	cgattccagc	960
gaaggaaaag	cgtattcctc	gtgagcacta	acttctcact	cctctcttct	tcttcttcat	1020
cagtctacgt	tcacacaatc	tttcacccac	ctattcaaag	ctctctccgg	aagtctcgag	1080
gggttggttg	ttggttttcc	cgatgacttc	ggatggagct	acgtcgacat	cagcagctgc	1140
agctgcggcg	gcggcagcag	cggcgaggag	gaagccgtcg	tggagagaaa	gggagaataa	1200
tcggaggaga	gaaagacgga	gaagagctgt	agctgcgaag	atatacactg	ggcttagagc	1260
tcaagggtgat	tataatttgc	ctaaacattg	tgataataat	gaagtcctta	aagctctttg	1320
tgttgaagct	ggttgggttg	ttgaagaaga	tgggtactact	tatcgcaagg	tgaagacttt	1380
ctccattttt	tccagatctg	agcttggttt	attgatgttt	ttgatgtttg	aatctgaatt	1440
cgttgatttc	aattgtgggt	aaatgggttt	gaatctgaga	atttgagggt	tttctcaaag	1500
tgaatttgaa	tcatacagaa	ctatggatgg	atctgatttc	tcaaagttaa	tttatgggtt	1560
ttctttctaa	ttttagagtt	attattggta	tgctaaagtc	ttaatctttt	atgtatgata	1620
cttgggtccaa	agtcattgca	ttgtgtttct	tttgcttacc	tgtgattgat	tgatgtttga	1680
ttggttattg	ttttgctttt	gttggagtat	cagggatgca	agcctttacc	tggtagagata	1740
gctgggactt	catctcgagt	aactccatat	tcatacacaga	accagagccc	tctttcatca	1800
gcctttcaaa	gtcccatccc	atcttaccaa	gttagcccg	cttcttcatc	attcccagag	1860
ccttctcgcg	gtgaaccaa	taacaacatg	tcctctacat	tcttcccttt	cctcagaaat	1920
ggtggcattc	cttctctctc	tccttccttc	agaatctcaa	acagttgtcc	agttacccca	1980
ccggtctcat	cgccgacttc	taagaaccgg	aaaccgttgc	ctaactggga	atctatcgct	2040
aagcaatcca	tggccattgc	taaacaatca	atggcgctct	ttaattatcc	tttctatgcg	2100
gtttctgcac	ctgctagtc	gacacatcgc	caccagtttc	ataccctggc	tactatacct	2160
gaatgtgatg	agtctgactc	ttccactgtt	gattctgggc	attggataag	ctttcagaag	2220
tttgcacaac	aacagccatt	ctctgcctct	atgggtgccaa	cctctcctac	cttcaatctt	2280

gtgaaacctg	cgcctcagca	gatgtctcca	aatactgctg	ccttccaaga	gattgggtcaa	2340
agctctgagt	ttaaatttga	gaatagccaa	gttaaaccct	gggaaggaga	gaggatacat	2400
gatgtgggta	tggaggatct	tgagcttaca	cttggaatg	ggaaggctcg	tggttgacat	2460
aaacaactag	gcaaacccaa	atggcatgtc	attggaatat	gagaaactaa	tcctcttgag	2520
tattttcttc	ttcgtccagg	tatttggtac	tttatggaat	ctcatatgtt	cttcacttat	2580
tatccaaata	tgctgcccaa	agccttctcc	atggaagcat	tggagtgtta	gagtggttat	2640
tcaattcatg	aatttggttt	caaagcatt	attttagat	aaaaaaa		2687

<210> 3

<211> 3000

<212> DNA

<213> NUCLEIC ACID

<400> 3

tgaatatcct	cacatttcca	ttttcgactc	tcttttagtaa	attttgaagt	agtagaatga	60
tgtagaatgt	tttgttttat	caatcacaca	gttttgtgaa	atcacgattt	ccatccacta	120
ttcaagaaaa	acatcaagtg	gaagaaataa	taaacccaaa	ccatcgcaac	aaaatgcata	180
tcacgagtat	agaatgaaca	aactacactg	tcaaatactt	aatttaggac	ttaaacttcg	240
ctttcagaca	acttggttcg	gaaacttgac	catccgtcat	gttgatatac	acaatccatc	300
tcaaattgtag	tagtgaatca	ctatatcagc	atgtgttatc	aaacgcaagt	tgctactaag	360
atcggagctt	ctagtccaaa	atgttgataa	gtattacgaa	agtacaattg	aatataccaa	420
ttatacatcc	aaacacgtcc	atgcttctcc	actcgagttc	tctttggaaa	tctatataat	480
ccgtcgggtt	ggtattttac	tagttgtacg	tagtgtctcc	cctcatatgt	attgagtctt	540
tatagtttgt	tgctcgtat	acgatagaaa	gtaaaggcta	aaaaaccata	ctatttcata	600
aagggtttat	ttagttaact	tttaatctaa	accatgtatc	actccatttt	acgtatatct	660
gttttcacaa	ataatctact	aaataatttt	gtaatgtgat	aaaattaaag	aataaacaca	720
tgatacataa	acagtcagga	caaaagtaag	cactcatttt	cttctattca	tactatagtg	780
aaacactatt	ttatttttat	ccatatacta	tagtgacaaa	ttaatcta	cattaaatgt	840
tatgaggctc	aaaacaattt	gttttcttat	ttaacatggc	cgatccctc	ataaaccaat	900
cagatgggtg	gttttccggt	catactcgtg	taggacccac	ttcattacaa	tggcccccaca	960
tgtctctcta	tctttttctc	ctctttataa	aatcagctcc	ttttcttaca	cagatttaga	1020
gaaacacaa	ataaaacgta	cttcttcttc	aaaacgcgaa	accacactgt	aagttacgta	1080
caccaccacc	tatcttcacc	attcatcatc	gacacgtggc	tggtttaact	caaatacaacg	1140
gtgaattcct	tttgcttttt	tattttaaat	aatgaatgaa	aagattcttc	tataattcca	1200
gcgaagaaga	aagaaaaaaa	aaagcgtatt	cctcgtgagc	actaacttct	cactcattct	1260
tcttcttcag	ctgaatccaa	atacccattt	ccatttttaa	ccgtgggttg	attgttttga	1320
gagttgaagg	aagaagatga	cgtctgacgg	agcaacgtcg	acgtcagctg	cagctgcagc	1380
agcagcgatg	gcgacgagga	ggaaaccgtc	gtggagagag	agggagaaca	atcggagaag	1440
agagcggcgg	agaagagctg	ttgcggcgaa	gatttatact	ggctcttagag	ctcaaggtaa	1500
ctacaatctt	ccaaaacatt	gtgacaacaa	tgaggttctt	aaggctcttt	gttctgaagc	1560
tggttggggt	gttgaagaag	acggaactac	ttatcgcaag	gtcagtatca	aacgcatttt	1620
tacttagatc	tgatgttatc	tgatgattta	gctgttgaat	ctgaagattt	ggatttgaaa	1680
ttggtcaaat	tgggattttc	ttggctatga	attcgagggt	tttagctgag	gaagctcagt	1740
tttattctaa	aattggatcg	agattccttg	cggagaaagt	gacctttagg	gttcttctta	1800
ctaatttgag	aaccgaatta	gctttacttt	cacttggtta	ctatatattag	atctctcctt	1860
tagcttttga	ttgattgtga	cattgtgatg	tttttggtat	tgttctatga	gcaacaggga	1920
cacaagcctc	tacctggtga	catggctgga	tcactttctc	gagcaactcc	ttactcttcc	1980
cataaccaaa	gtcctctttc	ttccactttt	gatagcccca	tcttatctta	ccaagtcagt	2040
ccttctctct	cttcattccc	gagtccttct	cgagttgggtg	atccacacaa	tatctccaca	2100
atcttccctt	tcctcaggaa	tgggtggtatt	ccttcatcgc	ttcctccact	tagaatctca	2160
aacagtgtc	ctgtcactcc	accagtgtca	tcccacactt	ctagaaaccc	caaaccattg	2220
cctacttggg	aatcttttac	caaacaatcc	atgtccatgg	ctgctaaaca	gtcaatgact	2280
tctttgaact	acccgtttta	tgcgggtgtct	gcacctgcc	gtcctactca	tcacgcagc	2340
ttccatgctc	cggctactat	acctgaatgt	gatgagctctg	actcttccac	tggttgattct	2400
ggtcattgga	taagctttca	aaagtttgca	caacaacagc	cattctctgc	ctctatgggtg	2460

```

ccaacctcgc ctaccttcaa tctcgtgaaa cctgcaccac agcaattgtc tccaaacaca 2520
gcagcaatcc aagagattgg tcaaagctcc gagtttaagt ttgagaacag ccaagttaag 2580
ccatgggaag gggagaggat ccatgatgtg gctatggagg atctagagct cacgcttgga 2640
aatggtaaag ctcatagttg agatgaagta tacatgaacc tgttatgtca tgtcggaaag 2700
aaggattgga gaatgagaat tagtgtgttg ttcattcagt tcatggtttt ggttcttggt 2760
ctagaatcga tattcattgt accagtgagt ttgtttcaca acgcattatt tgtagataga 2820
atgtttaaga tgtatgtttc tattatcatt ccttttaggt cttgaaaaca ttacaaatat 2880
attacatgat taagtggctt gaaatgtaaa ttatatatcg gatgatgaaa cagagaaaaa 2940
caagtgaggg taaaacaaag acttgggatg taataacaag atcagagagg ttaagaaaga 3000

```

```

<210> 4
<211> 1456
<212> DNA
<213> NUCLEIC ACID

```

```

<400> 4
gacccaattt ttacattaga tgaaaaaaat attattatth gttggagaag aaagagagat 60
tcttcttctt cgattccagc gaaggaaaag cgtattcctc gtgagcacta acttctcact 120
cctctcttct tcttcttcat cagtctacgt tcacacaatc tttcaccac ctattcaaag 180
ctctctccgg aagtttcgag ggggttggtg ttggttttcc cgatgacttc ggatggagct 240
acgtcgacat cagcagctgc agctgcggcg gcggcagcag cggcgaggag gaagccgtcg 300
tggagagaaa gggagaataa tcggaggaga gaaagacgga gaagagctgt agctgcgaag 360
atatacactg ggcttagagc tcaaggatgata tataatthgc ctaaacattg tgataataat 420
gaagtcctta aagctctthg tgttgaagct ggttggttg ttgaagaaga tgggtactact 480
tatcgcaagg gatgcaagcc tttacctggt gagatagctg ggacttcac tcgagtaact 540
ccatattcat cacagaacca gagccctctt tcatcagcct ttc aaagtc catcccatct 600
taccaagtta gcccgctctt ttcattcttc ccgagtcctt ctgcgggtga accaaataac 660
aacatgtcct ctacattctt cctttctctc agaaatggtg gcattccttc tctcttctct 720
tccctcagaa tctcaaacag ttgtccagtt accccaccgg tctcatcgcc gacttctaag 780
aaccggaac cgttgcctaa ctgggaatct atcgctaagc aatccatggc cattgctaaa 840
caatcaatgg cgtctthta tttaccttct tatgcggttt ctgcacctgc tagtccgaca 900
catcgccacc agtttcatac cccggctact atacctgaat gtgatgagtc tgactcttcc 960
actggtgatt ctggtcattg gataagcttt cagaagtttg cacaacaaca gccattctct 1020
gcctctatgg tgccaacctc tcttaccttc aatcttgta aacctgcgcc tcagcagatg 1080
tctccaaata ctgctgcctt ccaagagatt ggtcaaagct ctgagtttaa atthgagaat 1140
agccaagtta aaccttgga aggagagagg atacatgatg tgggtatgga ggatcttgag 1200
cttacacttg gaaatgggaa ggctcgtggt tgacataaac aactaggcaa acccaaatgg 1260
catgtcattg gaatatgaga aactaatcct cttgagtatt ttcttcttcg tccaggtatt 1320
tggatcttta tggaatctca tatgttcttc acttattatc caaatatgct gcccaaagcc 1380
ttctccatgg aagcattgga gtgttagagt ggttattcaa ttcattgaatt tggtttcaaa 1440
agcattatth gtagat
1456

```

```

<210> 5
<211> 1456
<212> DNA
<213> NUCLEIC ACID

```

```

<400> 5
gacccaatth ttacattaga tgaaaaaaat attattatth gttggagaag aaagagagat 60
tcttcttctt cgattccagc gaaggaaaag cgtattcctc gtgagcacta acttctcact 120
cctctcttct tcttcttcat cagtctacgt tcacacaatc tttcaccac ctattcaaag 180
ctctctccgg aagtttcgag ggggttggtg ttggttttcc cgatgacttc ggatggagct 240
acgtcgacat cagcagctgc agctgcggcg gcggcagcag cggcgaggag gaagccgtcg 300
tggagagaaa gggagaataa tcggaggaga gaaagacgga gaagagctgt agctgcgaag 360

```

```

atatacactg ggcttagagc tcaaggtgat tataatttgc ctaaacattg tgataataat 420
gaagtcctta aagctctttg tgttgaagct ggttgggttg ttgaagaaga tgggtactact 480
tatcgcaagg gatgcaagcc tttacctggt gagatagctg ggacttcacg tcgagtaact 540
ccatattcat cacagaacca gagccctctt tcatcagcct ttcaaagtcc catcccatct 600
taccaagtta gcccgtcttc ttcattcatc ccgagtcctt ctcgcggtga accaaataac 660
aacatgtcct ctacattctt ccctttcttc agaaatggtg gcattccttc ttctcttctt 720
tccttcagaa tctcaaacag ttgtccagtt accccaccgg tctcatcgcc gacttctaag 780
aaccggaaac cgttgccctaa ctgggaatct atcgctaagc aatccatggc cattgctaaa 840
caatcaatgg cgtcttttaa ttatcctttc tatgcggttt ctgcacctgc tagtccgaca 900
catcgccacc agtttcatac cctgggtact atacctgaat gtgatgagtc tgactcttcc 960
actgttgatt ctggtcattg gataagcttt cagaagtttg cacaacaaca gccattctct 1020
gcctctatgg tgccaacctc tcctaccttc aatcttgtga aacctgcgcc tcagcagatg 1080
tctccaaata ctgctgcctt ccaagagatt ggtcaaagct ctgagtttaa atttgagaat 1140
agccaagtta aaccctggga aggagagagg atacatgatg tgggtatgga ggatcttgag 1200
cttacacttg gaaatgggaa ggctcgtggt tgacataaac aactaggcaa acccaaatgg 1260
catgtcattg gaatatgaga aactaatcct cttgagtatt ttcttcttcg tccaggtatt 1320
tggatcttta tggaatctca tatgttcttc acttattatc caaatatgct gcccaaagcc 1380
ttctccatgg aagcattgga gtgtagagt ggttattcaa ttcatgaatt tggtttcaaa 1440
agcattatth gtagat                                     1456

```

<210> 6

<211> 336

<212> PRT

<213> AMINO ACID

<400> 6

```

Met Thr Ser Asp Gly Ala Thr Ser Thr Ser Ala Ala Ala Ala Ala Ala
 1          5          10          15
Ala Ala Ala Ala Ala Arg Arg Lys Pro Ser Trp Arg Glu Arg Glu Asn
          20          25          30
Asn Arg Arg Arg Glu Arg Arg Arg Arg Ala Val Ala Ala Lys Ile Tyr
          35          40          45
Thr Gly Leu Arg Ala Gln Gly Asp Tyr Asn Leu Pro Lys His Cys Asp
          50          55          60
Asn Asn Glu Val Leu Lys Ala Leu Cys Val Glu Ala Gly Trp Val Val
          65          70          75          80
Glu Glu Asp Gly Thr Thr Tyr Arg Lys Gly Cys Lys Pro Leu Pro Gly
          85          90          95
Glu Ile Ala Gly Thr Ser Ser Arg Val Thr Pro Tyr Ser Ser Gln Asn
          100          105          110
Gln Ser Pro Leu Ser Ser Ala Phe Gln Ser Pro Ile Pro Ser Tyr Gln
          115          120          125
Val Ser Pro Ser Ser Ser Ser Phe Pro Ser Pro Ser Arg Gly Glu Pro
          130          135          140
Asn Asn Asn Met Ser Ser Thr Phe Phe Pro Phe Leu Arg Asn Gly Gly
          145          150          155          160
Ile Pro Ser Ser Leu Pro Ser Leu Arg Ile Ser Asn Ser Cys Pro Val
          165          170          175
Thr Pro Pro Val Ser Ser Pro Thr Ser Lys Asn Pro Lys Pro Leu Pro
          180          185          190
Asn Trp Glu Ser Ile Ala Lys Gln Ser Met Ala Ile Ala Lys Gln Ser
          195          200          205
Met Ala Ser Phe Asn Tyr Pro Phe Tyr Ala Val Ser Ala Pro Ala Ser
          210          215          220
Pro Thr His Arg His Gln Phe His Thr Pro Ala Thr Ile Pro Glu Cys

```

225		230		235		240									
Asp	Glu	Ser	Asp	Ser	Ser	Thr	Val	Asp	Ser	Gly	His	Trp	Ile	Ser	Phe
		245		250		255									
Gln	Lys	Phe	Ala	Gln	Gln	Gln	Pro	Phe	Ser	Ala	Ser	Met	Val	Pro	Thr
		260		265		270									
Ser	Pro	Thr	Phe	Asn	Leu	Val	Lys	Pro	Ala	Pro	Gln	Gln	Met	Ser	Pro
		275		280		285									
Asn	Thr	Ala	Ala	Phe	Gln	Glu	Ile	Gly	Gln	Ser	Ser	Glu	Phe	Lys	Phe
		290		295		300									
Glu	Asn	Ser	Gln	Val	Lys	Pro	Trp	Glu	Gly	Glu	Arg	Ile	His	Asp	Val
305				310		315									320
Gly	Met	Glu	Asp	Leu	Glu	Leu	Thr	Leu	Gly	Asn	Gly	Lys	Ala	Arg	Gly
		325		330		335									

<210> 7
 <211> 336
 <212> PRT
 <213> AMINO ACID

<400> 7

Met	Thr	Ser	Asp	Gly	Ala	Thr	Ser	Thr	Ser	Ala	Ala	Ala	Ala	Ala	Ala
1				5					10					15	
Ala	Ala	Ala	Ala	Ala	Arg	Arg	Lys	Pro	Ser	Trp	Arg	Glu	Arg	Glu	Asn
			20				25					30			
Asn	Arg	Arg	Arg	Glu	Arg	Arg	Arg	Arg	Ala	Val	Ala	Ala	Lys	Ile	Tyr
		35				40					45				
Thr	Gly	Leu	Arg	Ala	Gln	Gly	Asp	Tyr	Asn	Leu	Pro	Lys	His	Cys	Asp
	50				55					60					
Asn	Asn	Glu	Val	Leu	Lys	Ala	Leu	Cys	Val	Glu	Ala	Gly	Trp	Val	Val
65				70				75						80	
Glu	Glu	Asp	Gly	Thr	Thr	Tyr	Arg	Lys	Gly	Cys	Lys	Pro	Leu	Pro	Gly
			85			90						95			
Glu	Ile	Ala	Gly	Thr	Ser	Ser	Arg	Val	Thr	Pro	Tyr	Ser	Ser	Gln	Asn
		100				105						110			
Gln	Ser	Pro	Leu	Ser	Ser	Ala	Phe	Gln	Ser	Pro	Ile	Pro	Ser	Tyr	Gln
		115				120						125			
Val	Ser	Pro	Ser	Ser	Ser	Ser	Phe	Pro	Ser	Pro	Ser	Arg	Gly	Glu	Pro
		130				135					140				
Asn	Asn	Asn	Met	Ser	Ser	Thr	Phe	Phe	Pro	Phe	Leu	Arg	Asn	Gly	Gly
145				150				155						160	
Ile	Pro	Ser	Ser	Leu	Pro	Ser	Leu	Arg	Ile	Ser	Asn	Ser	Cys	Pro	Val
			165			170							175		
Thr	Pro	Pro	Val	Ser	Ser	Pro	Thr	Ser	Lys	Asn	Pro	Lys	Pro	Leu	Pro
		180				185						190			
Asn	Trp	Glu	Ser	Ile	Ala	Lys	Gln	Ser	Met	Ala	Ile	Ala	Lys	Gln	Ser
		195				200						205			
Met	Ala	Ser	Phe	Asn	Tyr	Pro	Phe	Tyr	Ala	Val	Ser	Ala	Pro	Ala	Ser
		210			215						220				
Pro	Thr	His	Arg	His	Gln	Phe	His	Thr	Leu	Ala	Thr	Ile	Pro	Glu	Cys
225				230				235						240	
Asp	Glu	Ser	Asp	Ser	Ser	Thr	Val	Asp	Ser	Gly	His	Trp	Ile	Ser	Phe
			245			250								255	
Gln	Lys	Phe	Ala	Gln	Gln	Gln	Pro	Phe	Ser	Ala	Ser	Met	Val	Pro	Thr
		260				265							270		

Ser Pro Thr Phe Asn Leu Val Lys Pro Ala Pro Gln Gln Met Ser Pro
 275 280 285
 Asn Thr Ala Ala Phe Gln Glu Ile Gly Gln Ser Ser Glu Phe Lys Phe
 290 295 300
 Glu Asn Ser Gln Val Lys Pro Trp Glu Gly Glu Arg Ile His Asp Val
 305 310 315 320
 Gly Met Glu Asp Leu Glu Leu Thr Leu Gly Asn Gly Lys Ala Arg Gly
 325 330 335

<210> 8
 <211> 335
 <212> PRT
 <213> AMINO ACID

<400> 8
 Met Thr Ser Asp Gly Ala Thr Ser Thr Ser Ala Ala Ala Ala Ala Ala
 1 5 10 15
 Ala Met Ala Thr Arg Arg Lys Pro Ser Trp Arg Glu Arg Glu Asn Asn
 20 25 30
 Arg Arg Arg Glu Arg Arg Arg Arg Ala Val Ala Ala Lys Ile Tyr Thr
 35 40 45
 Gly Leu Arg Ala Gln Gly Asn Tyr Asn Leu Pro Lys His Cys Asp Asn
 50 55 60
 Asn Glu Val Leu Lys Ala Leu Cys Ser Glu Ala Gly Trp Val Val Glu
 65 70 75 80
 Glu Asp Gly Thr Thr Tyr Arg Lys Gly His Lys Pro Leu Pro Gly Asp
 85 90 95
 Met Ala Gly Ser Ser Ser Arg Ala Thr Pro Tyr Ser Ser His Asn Gln
 100 105 110
 Ser Pro Leu Ser Ser Thr Phe Asp Ser Pro Ile Leu Ser Tyr Gln Val
 115 120 125
 Ser Pro Ser Ser Ser Ser Phe Pro Ser Pro Ser Arg Val Gly Asp Pro
 130 135 140
 His Asn Ile Ser Thr Ile Phe Pro Phe Leu Arg Asn Gly Gly Ile Pro
 145 150 155 160
 Ser Ser Leu Pro Pro Leu Arg Ile Ser Asn Ser Ala Pro Val Thr Pro
 165 170 175
 Pro Val Ser Ser Pro Thr Ser Arg Asn Pro Lys Pro Leu Pro Thr Trp
 180 185 190
 Glu Ser Phe Thr Lys Gln Ser Met Ser Met Ala Ala Lys Gln Ser Met
 195 200 205
 Thr Ser Leu Asn Tyr Pro Phe Tyr Ala Val Ser Ala Pro Ala Ser Pro
 210 215 220
 Thr His His Arg Gln Phe His Ala Pro Ala Thr Ile Pro Glu Cys Asp
 225 230 235 240
 Glu Ser Asp Ser Ser Thr Val Asp Ser Gly His Trp Ile Ser Phe Gln
 245 250 255
 Lys Phe Ala Gln Gln Gln Pro Phe Ser Ala Ser Met Val Pro Thr Ser
 260 265 270
 Pro Thr Phe Asn Leu Val Lys Pro Ala Pro Gln Gln Leu Ser Pro Asn
 275 280 285
 Thr Ala Ala Ile Gln Glu Ile Gly Gln Ser Ser Glu Phe Lys Phe Glu
 290 295 300
 Asn Ser Gln Val Lys Pro Trp Glu Gly Glu Arg Ile His Asp Val Ala

305 310 315 320
Met Glu Asp Leu Glu Leu Thr Leu Gly Asn Gly Lys Ala His Ser
325 330 335

<210> 9
<211> 3000
<212> DNA
<213> Nucleic Acid

<400> 9
tgaatatacct cacattttcca ttttcgactc tcttttagtaa attttgaagt agtagaatga 60
tgtagaatgt tttgtttttat caatcacaca gttttgtgaa atcacgattt ccatccacta 120
ttcaagaaaa acatcaagtg gaagaaataa taaaccaaaa ccatcgcaac aaaatgcata 180
tcacgagtat agaatgaaca aactacactg tcaaataactt aatttaggac ttaaacttcg 240
ctttcagaca acttggttcg gaaacttgac catccgcat gttgatatac acaatccatc 300
tcaaagttag tagtgaatca ctatatcagc atgtgttatc aaacgcaagt tgtcactaag 360
atcggagctt ctagtccaat atgttgataa gtattacgaa agtacaattg aatataccaa 420
ttatacatcc aaacacgtcc atgcttctcc actcgagttc tctttggaaa tctatataat 480
ccgtcgggtt ggtattttac tagttgtacg tagtgtctcc cctcatatgt attgagtctt 540
tatagtttgt tgcctcgtat acgatagaaa gtaaaggcta aaaaaccata ctatttcata 600
aagggtttat ttagttaact tttaatctaa accatgtatc actccatttt acgtatatct 660
gttttcacaa ataacttact aaataatttt gtaatgtgat aaaattaaag aataaacaca 720
tgatacataa acagtcagga caaaagtaag cactcatttt cttctattca tactatagt 780
aaacactatt ttatttttat ccataacta tagtgacaaa ttaatctaata cattaaatgt 840
tatgaggctc aaaacaattt gttttcttat ttaacatggc cgatcccctc ataaaccaat 900
cagatgggtg gttttccggt catactcgtg taggaccac ttcattacaa tggccccaca 960
tgtctctcta tctttttctc ctctttataa aatcagctcc ttttcttaca cagatttaga 1020
gaaacacaac ataaaacgta ctctctcttc aaaacgcgaa accacactgt aagttacgta 1080
caccaccacc tatcctcacc attcatcatc gacacgtggc tgggttaact caaatcaacg 1140
gtgaattctt tttgcttttt tattttaaat aatgaatgaa aagattcttc tataattcca 1200
gcgaagaaga aagaaaaaaa aaagcgtatt cctcgtgagc actaacttct cactcattct 1260
tcttcttcag ctgaatccaa ataccatttt ccatttttaa ccgtggttg attgttttga 1320
gagttgaagg aagaagatga cgtctgacgg agcaacgctc acgtcagctg cagctgcagc 1380
agcagcgatg gcgacgagga ggaaaccgtc gtggagagag agggagaaca atcggagaag 1440
agagcggcgg agaagagctg ttgcggcgaa gatttatact ggtcttagag ctcaaggtaa 1500
ctacaatctt ccaaaacatt gtgacaacaa tgagggtctt aaggctcttt gttctgaagc 1560
tggttggtgt gttgaagaag acggaactac ttatcgcaag gtcagtatca aacgcatttt 1620
tacttagatc tgatgttatc tgatgattta gctgttgaat ctgaagattt ggatttgaaa 1680
ttggtcaaat tgggattttc ttggctatga attcgaggtt tttagctgag gaagctcagt 1740
tttattctaa aattggatcg agattccttg cggagaaagt gaccttagg gttcttctta 1800
ctaatttgag aaccgaatta gctttacttt cacttggtta ctatatttag atctctcctt 1860
tagcttttga ttgattgtga cattgtgatg tttttggtat tgttctatga gcaacaggga 1920
cacaagcctc tacctggtga catggctgga tcatcttctc gagcaactcc ttactcttcc 1980
cataaccaa gtccctcttc ttccactttt gatagcccca tcttatctta ccaagtcagt 2040
ccttcctctt cttcattccc gagtccctct cgagttggtg atccacacaa tatctccaca 2100
atcttccctt tctcaggaa tgggtggtatt ccttcacgc ttcctccact tagaatctca 2160
aacagtgtc ctgtcactcc accagtgtca tccccactt ctagaaaccc caaaccattg 2220
cctactggg aatcttttac caaacaatcc atgtccatgg ctgctaaaca gtcaatgact 2280
tctttgaact acccgtttta tgcgggtgtc gcacctgcca gtcctactca tcatcgccag 2340
ttccatgtc tggctactat acctgaatgt gatgagctc actcttccac tgttgattct 2400
ggtcattgga taagctttca aaagtttgca caacaacagc cattctctgc ctctatggtg 2460
ccaacctcgc ctacctcaa tctcgtgaaa cctgcaccac agcaattgtc tccaaacaca 2520
gcagcaatcc aagagattgg tcaaagctcc gagtttaagt ttgagaacag ccaagttaag 2580
ccatgggaag gggagaggat ccatgatgtg gctatggagg atctagagct cacgcttgga 2640

<210> 11
 <211> 1213
 <212> DNA
 <213> Nucleotide

<400> 11

```
tataattcca gccaagaaga aagaaaaaaaa aaagcgtatt cctcgtgagc actaacttct 60
cactcattct tcttcttcag ctgaatccaa ataccatttt ccatttttaa ccgtgggttg 120
attgttttga gagttgaagg aagaagatga cgtctgacgg agcaacgtcg acgtcagctg 180
cagctgcagc agcagcgatg gcgacgagga ggaaaccgtc gtggagagag agggagaaca 240
atcggagaag agagcggcgg agaagagctg ttgcggcgaa gatttatact ggtcttagag 300
ctcaaggtaa ctacaatctt ccaaaacatt gtgacaacaa tgaggttctt aaggctcttt 360
gttctgaagc tgggtggggt gttgaagaag acggaactac ttatcgcaag ggacacaagc 420
ctctacctgg tgacatggct ggatcatctt ctcgagcaac tccttactct tcccataacc 480
aaagtcctct ttcttccact tttgatagcc ccattctatc ttaccaagtc agtccttctt 540
cttcttcatt cccgagtcct tctcgagttg gtgatccaca caatatctcc acaatcttcc 600
ctttcctcag gaatgggtgg attccttcat cgcttctctc acttagaatc tcaaacagtg 660
ctcctgtcac tccaccagtg tcatcccaa cttctagaaa ccccaaacca ttgcctactt 720
gggaatcttt taccaaacaa tccatgtcca tggctgctaa acagtcaatg acttctttga 780
actaccggtt ttatgcggtg tctgcacctg ccagtcctac tcatcatcgc cagttccatg 840
ctccggctac tatacctgaa tgtgatgagt ctgactcttc cactgttgat tctggtcatt 900
ggataagctt tcaaaagttt gcacaacaac agccattctc tgcctctatg gtgccaacct 960
cgcctacctt caatctcgtg aaacctgcac cacagcaatt gtctccaaac acagcagcaa 1020
tccaagagat tgggtcaaagc tccgagttta agtttgagaa cagccaagtt aagccatggg 1080
aaggggagag gatccatgat gtggctatgg aggatctaga gctcacgctt ggaaatggta 1140
aagctcatag ttgagatgaa gtatacatga acctgttatg tcatgtcgga aggaaggatt 1200
ggagaatgag aat                                     1213
```

<210> 12
 <211> 1213
 <212> DNA
 <213> Nucleotide

<400> 12

```
tataattcca gccaagaaga aagaaaaaaaa aaagcgtatt cctcgtgagc actaacttct 60
cactcattct tcttcttcag ctgaatccaa ataccatttt ccatttttaa ccgtgggttg 120
attgttttga gagttgaagg aagaagatga cgtctgacgg agcaacgtcg acgtcagctg 180
cagctgcagc agcagcgatg gcgacgagga ggaaaccgtc gtggagagag agggagaaca 240
atcggagaag agagcggcgg agaagagctg ttgcggcgaa gatttatact ggtcttagag 300
ctcaaggtaa ctacaatctt ccaaaacatt gtgacaacaa tgaggttctt aaggctcttt 360
gttctgaagc tgggtggggt gttgaagaag acggaactac ttatcgcaag ggacacaagc 420
ctctacctgg tgacatggct ggatcatctt ctcgagcaac tccttactct tcccataacc 480
aaagtcctct ttcttccact tttgatagcc ccattctatc ttaccaagtc agtccttctt 540
cttcttcatt cccgagtcct tctcgagttg gtgatccaca caatatctcc acaatcttcc 600
ctttcctcag gaatgggtgg attccttcat cgcttctctc acttagaatc tcaaacagtg 660
ctcctgtcac tccaccagtg tcatcccaa cttctagaaa ccccaaacca ttgcctactt 720
gggaatcttt taccaaacaa tccatgtcca tggctgctaa acagtcaatg acttctttga 780
actaccggtt ttatgcggtg tctgcacctg ccagtcctac tcatcatcgc cagttccatg 840
ctctggctac tatacctgaa tgtgatgagt ctgactcttc cactgttgat tctggtcatt 900
ggataagctt tcaaaagttt gcacaacaac agccattctc tgcctctatg gtgccaacct 960
cgcctacctt caatctcgtg aaacctgcac cacagcaatt gtctccaaac acagcagcaa 1020
tccaagagat tgggtcaaagc tccgagttta agtttgagaa cagccaagtt aagccatggg 1080
```

